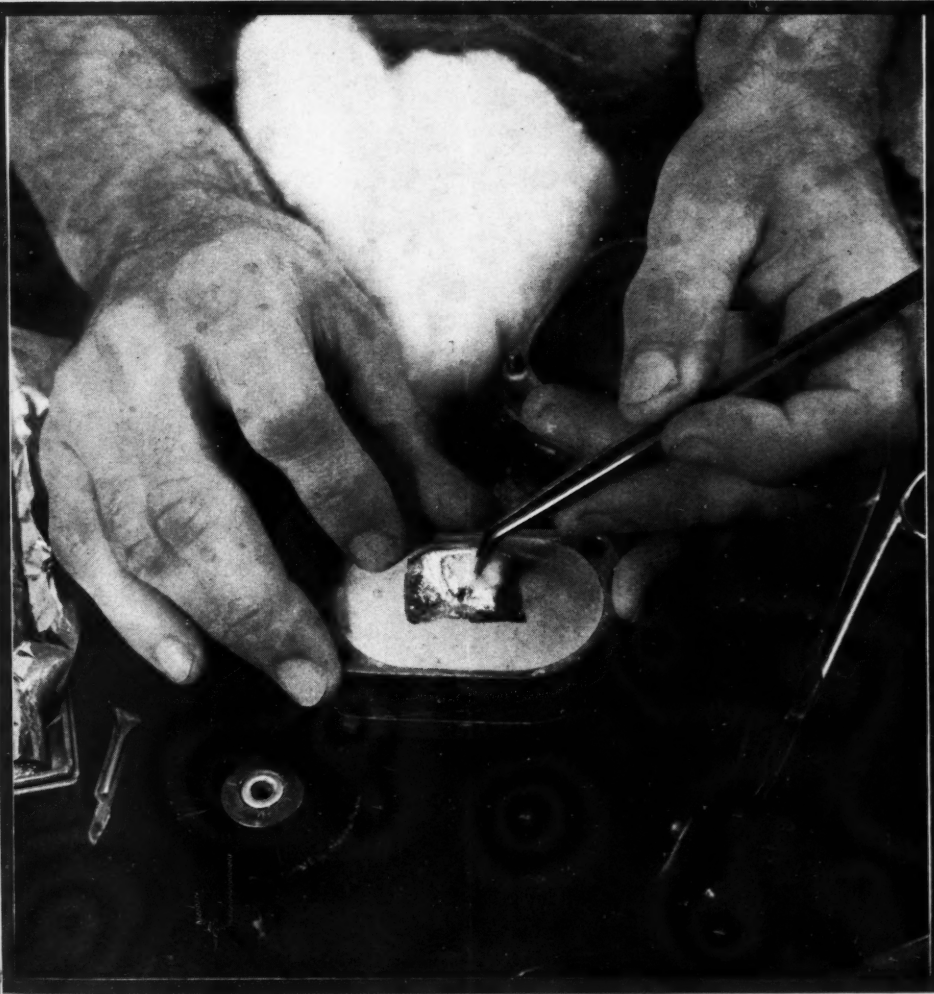
DENTAL Digest



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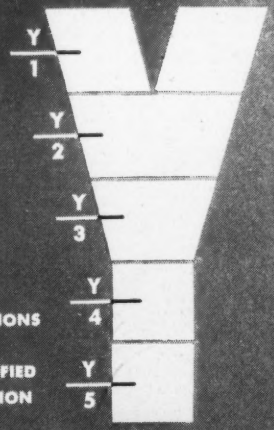

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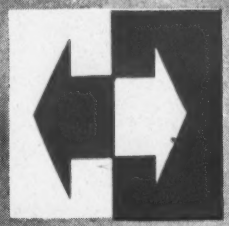

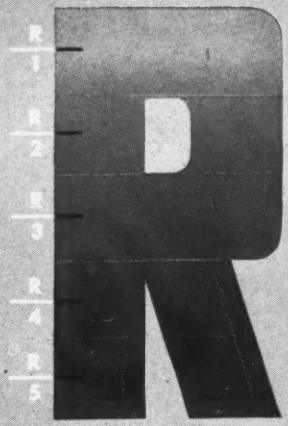

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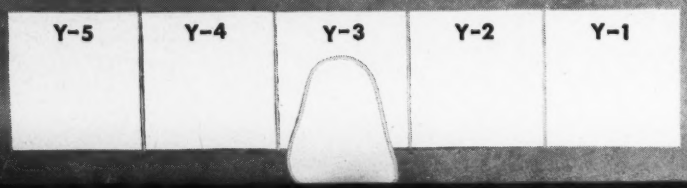

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EVANSTON, ILLINOIS

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VOL. 50 NO. 5

MAY 1944

Resilient Resins: Technique for Their Use in Complete and Partial Dentures....204
Stanley D. Tylman, A.B., D.D.S., M.S.

Technique for Acrylic Crowns and Inlays, *A. M. Lodmell, D.D.S.*....210

Temporomandibular Malarticulation, *Marvin M. Sugarman, D.D.S.*....214

Arteriovenous Aneurysm Resulting from Application of Rodger Anderson Splint (An Abstract).....217
Lieutenant Commander Paul W. Greeley (MC) and Lieutenant Albert H. Throndson (DC), U.S.N.R.

Clinical and Laboratory Suggestions, *Chester J. Henschel, D.D.S.*....218

Leukemia in Physicians (An Abstract)....220

Penicillin in the Treatment of Cellulitis of the Mouth (An Abstract)....238
Wallace E. Herrell, M.D. and Donald R. Nichols, M.D.

The Editor's Page....221 Contra-Angles....224

Dental Meeting Dates....232

EDWARD J. RYAN, B.S., D.D.S., *Editor*
ETHEL H. DAVIS, A.B., *Assistant Editor*
(In Military Service)
RUTH K. BARNHART, *Assistant Editor*
708 *Church Street, Evanston, Illinois*

About Our CONTRIBUTORS

STANLEY D. TYLMAN, A.B., D.D.S., M.S. (Notre Dame, and Northwestern University Dental School) is Professor of Prosthetics, University of Illinois, College of Dentistry. He is the author of numerous articles on crown and bridge prosthesis and acrylics. In April 1943 Doctor Tylman presented the use of resilient synthetic resins in dental and maxillofacial prosthesis. This month he describes his technique for the use of resilient resins in complete and partial dentures. The technique in maxillofacial prosthesis will be presented here next month.

ANTON M. LODMELL, D.M.D. (North Pacific Dental College, Oregon, 1926) is in general practice. He describes his technique of using acrylic in crowns and inlays.

MARVIN M. SUGARMAN, D.D.S. (Atlanta-Southern Dental College, 1938) is a general practitioner. Doctor Sugarman reports a case in which, by means of dental appliances, tubal catarrhal deafness was improved by restoring the normal anatomical relationship of the temporomandibular joints.

CHESTER J. HENSCHEL, D.D.S. (New York College of Dentistry, 1929) has presented practical ideas in the series of CLINICAL AND LABORATORY SUGGESTIONS each month since January of this year. His suggestions this month are: A PRACTICAL SHADE GUIDE FOR SILICATES, A LEAKY WATER JACKET TRAY PUT TO USE, PREPARATION OF LUG SEATS IN WAX PATTERNS, and DETERMINING AN INTERPROXIMAL HIGH SPOT.

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Resilient Resins: Technique for Their Use in Complete and Partial Dentures

STANLEY D. TYLMAN, A.B., D.D.S., M.S., Chicago

DIGEST

A technique is described for the use of two types of resilient synthetic resins in dentures in conjunction with standard types of hard methylmethacrylates. Such use is indicated in the following conditions:

1. To line or reline complete or partial dentures.

2. To relieve the hard and palatine foramina of an edentulous mouth.

3. To be placed on dentures on which pronounced undercuts of the ridge exist, thus allowing the denture to "spring" into position of proper tissue adaptation.

4. To be used as a soft peripheral bead or flange in dentures.

In April 1943 I recorded the first use of resilient synthetic resins in dental and maxillofacial prostheses.[1] So many requests for additional information have been received from all parts of the country that the present article is prepared to give the step-by-step technique in the use of the resilient resins in denture prosthesis.

Resilient resins have three primary uses in denture prosthesis: (1) as a complete cushion-like lining of a denture base (Figs. 1A and 1B); (2) as a soft peripheral border or flange of a denture (Figs. 2A and 2B); and (3) as a resilient base over the palatine areas referred to as the "hard palate raphe" and those overlying the posterior and anterior palatine foramina (Figs. 3A and 3B). The resilient resins have a fourth use in removable partial dentures: to supply a nonrigid connection between the clasp and the base of the partial denture.

Fig. 1A

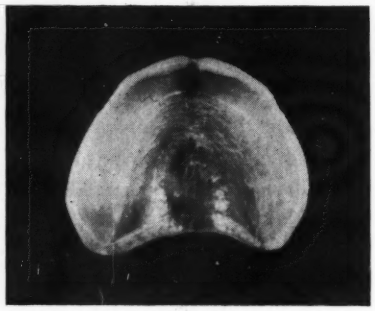


Fig. 1B

Figs. 1A and 1B—Cross section and photograph of denture having inner surface lined with thin layer of resilient resin.

Fig. 2A

Fig. 2B

Figs. 2A and 2B—Buccolingual cross section indicating use of resilient resin in peripheral seal area of buccal flanges.

Resilient resins of the vinylite group were employed in my original experiments and clinical appliances; some of these have given four years of service. Two manufacturers have recently developed resilient synthetic resin copolymers which are more easily manipulated than the original vinyls, and which are furnished in the same colors as the hard, pink acrylic resins used in the denture base. Stains which make it possible to produce unlimited color modifications are now available.

One manufacturer offers the resilient resin in the familiar powder and liquid form; the other offers a previously polymerized thermoplastic resilient resin which is adapted to the mold under heat and pressure. Inasmuch as both are copolymers of the acrylate group of resins, they can be used successfully in combination with the hard acrylic denture base materials which are methylmethacrylates. In the techniques described in this article, the use of the powder-liquid type of methacrylate, copolymer resilient resin, and the use of a polymerized vinyl copolymer resin will be described. I wish to acknowledge the work of Doctor Fred Slack of Philadelphia in the development of the powder-liquid type of methacrylate.

Technique with Powder-Liquid Methacrylate

Mixing—A slight variance in the amount of liquid used in mixing denture base acrylic does not seriously affect the physical properties of the polymerized denture. In mixing resilient resin, however, the amount of liquid used definitely affects the degree of softness of the resin. The proportions for the different degrees of softness are:

Normal Softness: 15 cc. polymer

[1]Tylman, Stanley D.: The Use of Elastic and Resilient Resins and Their Copolymers in Oral, Dental, and Facial Prostheses, The Dental Digest, 49:167 (April) 1943.

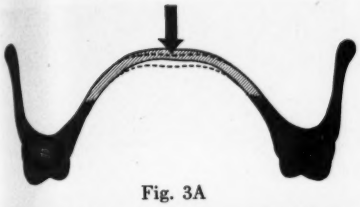


Fig. 3A

Fig. 3B

Figs. 3A and 3B—Cross section and photograph of area overlying hard palate raphe; as ridges resorb, denture settles and elasticity in the raphe region prevents rocking or fracture of denture.

(powder) to 9 cc. monomer (liquid) (Fig. 4).

Increased Softness: 15 cc. polymer to 10 cc. monomer.

Decreased Softness: 15 cc. polymer to 8 cc. monomer.

1. Measure the correct proportions of polymer and monomer, and mix them thoroughly with a glass rod or a stainless steel spatula in a clean glass jar. The mixture will be thin and watery in appearance.

2. Screw the cap tight on the jar, and set it aside for 15 minutes to 30 minutes. The warmer the room, the less time is required for the mixture to reach the correct consistency for packing. The setting process may be accelerated by dipping the bottom of the jar in hot water for 15 seconds.

The consistency of the resilient resin for best results is that physical condition or state in which it may be compressed into the denture mold without displacing the acrylic denture base material already in the mold; it should be thick and resistant enough to be capable of compression during test packing. It should not, however, be of the same doughy consistency as is denture material; if it were packed too thick, it could not be distributed in an even thick layer and would cause areas of localized weakness in the denture.[2]

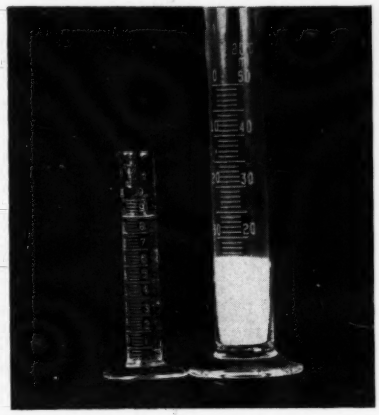


Fig. 4—Resilient resin mixed in proportions 9 cc. liquid and 15 cc. powder results in a resin of normal softness.

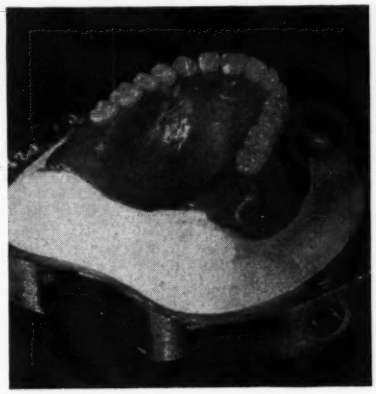


Fig. 5—Waxed denture invested in lower half of flask, and liquid separator applied to investment.

Fig. 6—Core of hard stone ¼ inch thick applied over occlusal and incisal surfaces of teeth and against buccal, lingual, and palatine surfaces.

Technique—The following steps cover the technique of using the methacrylate copolymer resilient resin on a new denture:

1. Invest the waxed denture in the lower half of the flask. Apply a liquid separator to the investment (Fig. 5); *do not use tin foil.*

2. Mix a hard stone, and apply a core ¼ inch thick over the occlusal and the incisal surfaces of the teeth as well as over the waxed buccal, lingual, and palatine surfaces. This gives a relatively thin core of hard stone against which to process the acrylic; it holds the teeth in place during trial closures and processing (Fig. 6).

3. Paint the outside of the hardened core with a separator, and pour the upper half of the flask in the regular plaster (Fig. 7).

4. Allow the investment to set for 20 minutes. Then place the flask in a pan of boiling water for only 4 minutes; if it is left in the boiling water for a longer time, the wax will melt and soak into the investment material. Remove the flask from the pan and separate the halves carefully. Wash out the wax by pouring boiling water into the mold and on the cast; borax may be dissolved in the boiling water to help remove the wax, but chloroform or other wax solvents should not be used (Fig. 8).

5. Dry the halves of the flask, and while they are hot apply liquid separator freely over all exposed surfaces of the stone core and the plaster cast (Fig. 9). Allow this separator to remain on the core and the cast for 20 seconds to 30 seconds; then shake out the excess, and place the flask sections upside down on a bench and allow to dry for 5 minutes to 10 minutes. This should leave a glazed surface; if it is not glossy, apply another coat of the separator and dry.

6. Adapt a wax baseplate on the plaster cast in the lower half of the flask. Trim the peripheral border of the wax baseplate back to the margin where the resilient resin will join the hard denture base material (Fig. 10). It is important that the thickness of the wax baseplate be the same

[2]Sheet of Instructions, H. D. Justi & Son, Inc., Philadelphia.

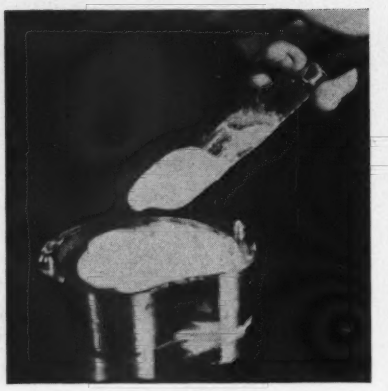


Fig. 7—Upper half of flask poured in plaster.

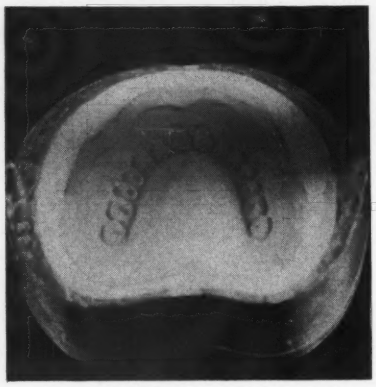


Fig. 8—Upper half of flask after investment has set and wax has been removed.

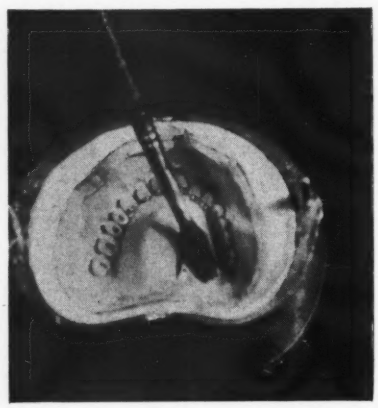


Fig. 9—Liquid separator being applied over all exposed surfaces of stone core and plaster cast.

as the thickness of the resilient resin lining will be in the finished denture. The thickness of the wax may be varied in different places; in an immediate replacement denture, the area overlying the recently extracted teeth is usually given a thicker layer of resilient resin. The resin, likewise, may be made softer by increasing its monomer content; this is necessary in making lower dentures in which thin, tender, knife-like ridges are found. Favorable results have been observed when the areas of the posterior and anterior palatine foramina have been relieved by the use of the resilient resin.

7. Mix the regular pink denture base acrylic in the proportions of three parts powder to one part liquid, and allow the mix to stand in the jar until the proper doughy consistency has been reached. Pack the mixture into the upper half of the flask in the customary manner. Moist cellophane is then interposed between the halves of the flask and a trial closure is made; during this operation the wax baseplate remains on the plaster cast and displaces some of the acrylic denture base material (Fig. 11).

Later when the wax baseplate is removed from the cast, a space is left between the cast and the denture base material; this will be filled with the resilient resin.

The margin of the wax baseplate will disclose the indented outline and the position of the peripheral border of resilient resin in the denture (Fig. 12). When the trial closure indicates that the mold is completely filled with the acrylic denture base material, set the flask (closed in the press) aside while the resilient resin is measured and mixed thoroughly in a glass jar. Fifteen cubic centimeters of powder and 9 cc. of liquid are usually enough for the average lining of a denture.

8. After the resilient resin in the jar has set to the proper consistency, remove the flask from the press and separate. Remove the wax baseplate from the cast and, using a hot spatula, cut away the entire peripheral bead of acrylic denture base material at the depressed outline left by the wax baseplate. The cut should be made in an even line to allow a perfect union between the resilient border and the hard denture base acrylic (Fig. 13).

9. If a relief area is to be made over the palatine raphe or the foramina, the regular pink acrylic denture base material is cut out with a hot spatula to expose the underlying stone investment (Fig. 14).

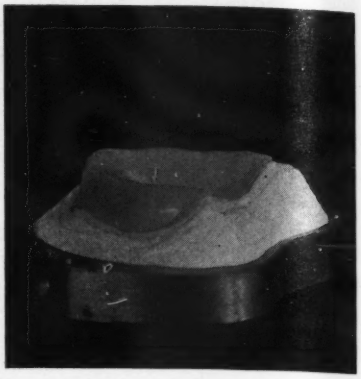


Fig. 10—Wax baseplate adapted on plaster cast in lower half of flask; periphery of baseplate trimmed back to margin where resin will join hard denture base material.

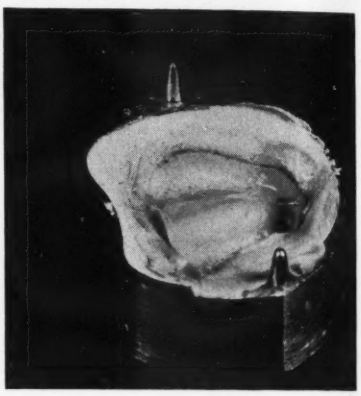


Fig. 11—Acrylic mix in upper half of flask; moist cellophane interposed between halves of flask before trial closure is made.

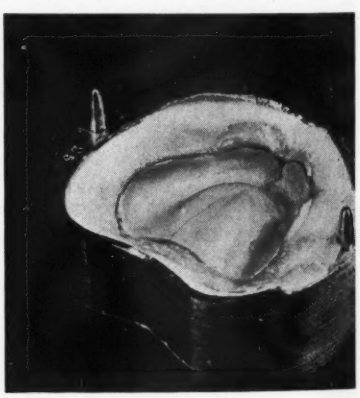


Fig. 12—Margin of wax baseplate discloses indented outline and position of peripheral border to be replaced with resilient resin in denture.

10. Using a stainless steel spatula and moist cellophane wrapped around the index finger, remove the resilient resin from the jar in small amounts and apply evenly over the vault

Fig. 13—Entire peripheral bead of acrylic cut away at depressed outline left by wax baseplate.

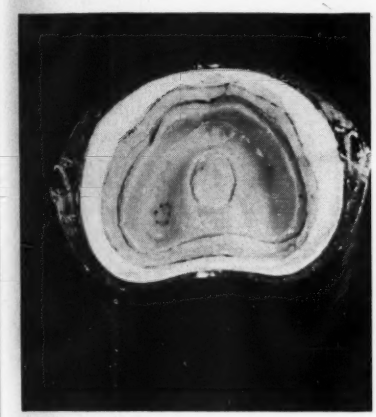


Fig. 14—Hard acrylic cut out to expose underlying stone investment preparatory to making resilient relief area over palatine raphe or foramina.

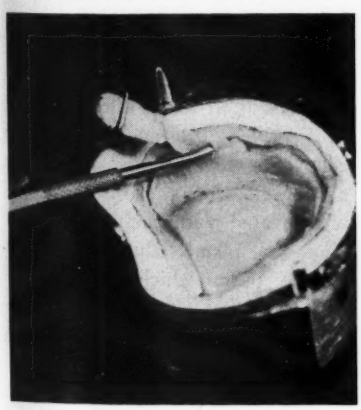


Fig. 15—Resilient resin applied over vault areas and additional amounts being forced to flow around peripheral border of denture.

areas; additional amounts are forced to flow into the space around the peripheral border of the denture (Fig. 15). Interpose a sheet of moist cellophane, and place the halves of the flask in the press. Apply pressure slowly to allow the resilient resin to fill all the spaces completely and the excess to escape slowly between the halves of the flask. Great care should be exercised at this point not to displace the regular hard denture base acrylic. Bring the flask to within 1 mm. of complete closure.

11. Upon opening the flask, remove all surplus material; place the lower half of the flask, which contains the cast, in hot water for 15 seconds, and dry it. Cellophane is again placed between the halves of the flask and the flask is closed, the section containing the cast still being warm. Apply pressure slowly so that 15 minutes of time are consumed in making complete closure. During this 15 minute period, the warmed cast has accelerated the setting of the resilient resin to the consistency at which maximum compression of the material is obtainable. Such a procedure likewise assures the elimination of any air space.

12. Remove the flask from the press, open it, and cut away all excess material. For the final closure, extreme care must be exercised to prevent folds or creases in the cellophane; if a part of the cellophane is enfolded within the resin, it will cause a break in the material. Tin foil is not to be used in contact with this type of resilient resin.

As a final precaution, the cast should be warmed and a coat of separator applied to it so that a glossy film is visible after the surface has dried. Place two small pieces of the resilient resin, each about the size of a pea, in the molar regions (Fig. 16), and make the final closure of the flask in the press. A spring type press should be used. It is recommended that the cross arm of the press be turned back one turn prior to placing the flask and the press into the water for processing. This slight release of pressure permits thermal expansion of the material during the initial stages of processing without danger of distorting the mold. When polymerization starts, the material shrinks, whereupon the force of the spring again completely closes the flask.

Fig. 16—Small piece of resilient resin placed in each molar region prior to final closure of flask.

Fig. 17—Stone core comes away with denture from upper half of flask after processing.

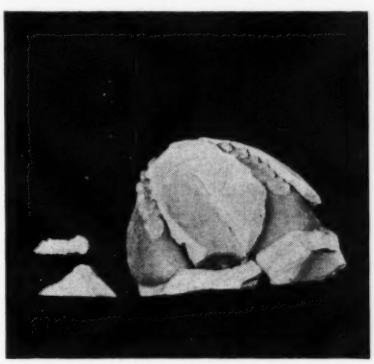


Fig. 18—Stone core broken away from buccal, labial, and palatal portions of denture.

13. The processing of the denture may be accomplished by placing the flask and the press in water of 158° F. This temperature should be maintained for an hour, after which the water is slowly brought to the boiling point, 212° F., and kept there for one-half hour. At the expiration of this time, remove the press and

the flask from the water and allow them to cool on the bench for an hour; then place them in running tap water for 30 minutes. The flask may now be removed from the press and opened carefully. Usually the stone core section will come away with the denture from the upper half of the flask (Fig. 17). The core, which is ¼ inch thick, is now easily broken away from the buccal, labial, and palatal portions of the denture (Fig. 18).

14. Separate the cast and the denture from the plaster in the lower half of the flask. The denture frequently may be removed from the cast because of the presence of the cellophane and the resilient nature of the denture lining and of the peripheral border (Fig. 19). If separation does not take place readily, one or more V-shaped grooves may be cut into the base of the cast, after which the parts of the cast are easily dislodged (Fig. 20). The denture is now ready for finishing and polishing (Fig. 21).

Little time or effort will be required for this operation if the waxing and finishing of the waxed denture were done carefully. The hard acrylic surfaces are finished and polished in the usual manner. Inasmuch as the resilient resin is a softer material, certain precautions must be observed: Resilient resins should not be overheated in polishing; therefore, slow-running lathe wheels with wet pumice are advised. The final polish may be obtained by using light pressure against a rag wheel with whiting or a wax polisher. Fine manicure scissors may be used to cut away any flash or nodule of the resilient material; likewise, coarse finishing stones similar to Hygienic CC stone trimmers are useful for this purpose. If the denture is properly finished, it is hard to distinguish the line of demarcation between the two types of material used in the same denture.

When undercuts are present, such as frequently occur in the region of the maxillary tuberosities (Fig. 22), or when it is desirable to extend the lingual flanges of lower dentures into the retromylohyoid regions (Fig. 23), these extensions may be made entirely of the resilient resin if the conditions permit the use of sufficient bulk. If sufficient bulk is not permitted, the combination of a hard acrylic material on the outer surface with an inner lining of the resilient resin is employed.

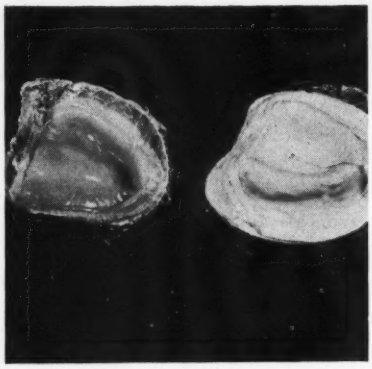


Fig. 19—Cellophane, and the resiliency of denture lining and peripheral border, aid in removing processed denture from cast.

Fig. 20—Parts of cast are easily dislodged if V-shaped grooves are cut into base of cast.

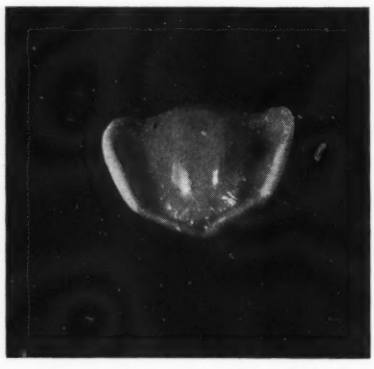


Fig. 21—Denture ready for finishing and polishing.

Technique with Polymerized Vinyl Copolymer Resin

This type of resilient resin is likewise a product of copolymerization; however, it comes already polymerized and cut up in small pieces and strips ready for packing into the mold. No liquid is used. The material is placed in the mold, heated to the correct temperature, and conformed to shape under pressure in the flask. Because of this, the following technique is a modification of the first technique which employs powder and liquid. I wish to acknowledge the work of W. T. Sweeney and Harold Vernon of Pittsburgh, Pennsylvania, in its development.

The directions given by the manufacturer[3] indicate that the pieces of soft resin may be used in the construction of a new denture by packing the resin into the mold with the regular denture base material and by processing both in one heating. The soft resin may, however, be added to a previously processed denture. The first method is more likely to give a better union of the two types of material.

Relieving the Hard Area of the Palate—1. After the denture is trial packed with regular denture base resin in the usual manner, the relief area over the hard palate is cut out with a hot spatula. The excess piece of resin is removed and the entire vault and ridge areas are covered with a piece of moist cellophane. *It is important that the flask be previously heated to* 140° *F.* Pieces of the soft resin 2 mm. to 4 mm. thick and 2 cm. to 3 cm. long are now placed on the cellophane covering the area of the hard vault which was cut away, and are covered with another piece of moist cellophane. The other section of the flask, which was likewise heated to 140° F., is placed in position and a trial closure is made until a satisfactory molded surface is obtained. If the flask should be too cold for easy molding, it may be placed in boiling water for 3 minutes to 5 minutes.

2. After the final trial packing is completed, the flask is separated, and the soft resin between the two sheets of cellophane is removed and trim-

[3]The Vernonite Work Bench, Vernon-Benshoff Co., Pittsburgh, 3:1 (March) 1944.

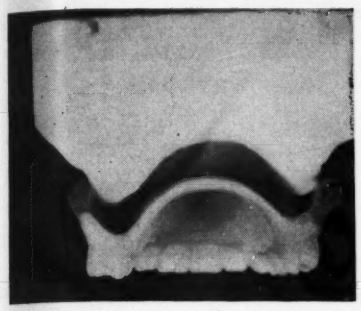


Fig. 22—Finished denture showing resilient resin undercuts in region of maxillary tuberosities.

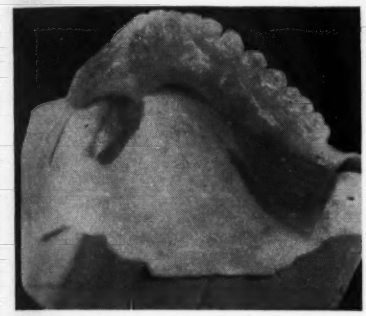


Fig. 23—Lingual flanges extended with resilient resin into retromylohyoid region.

med to the outline of the relief area. All remaining cellophane from the soft resin is peeled off, and the resin is reinserted into position in the flask. It is well at this time to moisten the edges of the resin and the denture base material with a small amount of liquid (monomer).

3. A piece of soft resin the size of a pea is now added to insure compression. The entire denture is covered with moist cellophane, and the flask is closed slowly in a spring-clamp press.

4. The case is processed, cooled, and finished as described in the first technique.

The same general principles of procedure are followed in the replacement of the peripheral border or flanges with the soft resin.

Adding to a Previously Processed Denture—1. This method may be employed successfully either on new dentures or on old acrylic dentures. After all undercuts are eliminated with stones or burs, the old denture is cut away from those areas in which the soft resin is desired.

2. An impression is taken as for a rebasing or lining procedure. A cast is poured and the case is flasked in the usual manner up to the point of repacking.

3. The exposed palatine surfaces are now thoroughly cleaned and dried, and a liberal amount of monomer liquid is applied. The liquid is applied with a brush and is allowed to stand for 5 minutes until it softens the surface of the processed denture slightly.

4. A second application of monomer is made, and small pieces of the soft resin in the amounts indicated are placed in the desired positions.

5. A trial closure with moist cellophane is made in the usual manner. If difficulty is experienced in closing the flask, it should be heated to 140° F. by placing the flask and the press in boiling water for 3 minutes to 5 minutes.

6. Closure and processing are done as previously described, after which the denture is cooled and finished in the prescribed manner.

Comments

The new resilient synthetic resins and their copolymers may be used to line complete upper and lower dentures with the result that patients experience a soft, cushion-like effect between the denture and the mucosa of the vault and ridges. This is especially true with the immediate replacement type of denture. The areas which formerly required relief chambers as a result of the pressure caused by the hard acrylic materials are now covered with a resilient layer of soft resin which yields under pressure and thus prevents the riding of the denture on the palatine raphe. Because the new resin is resilient, it may be placed along the periphery of a denture, allowing it to spring over tuberosities without injuring

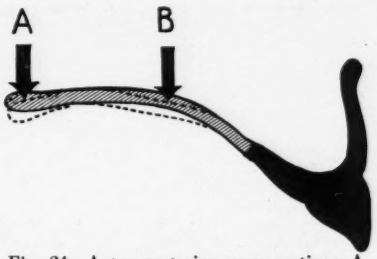


Fig. 24—Anteroposterior cross section: A, region of postdam area where use of resilient resin prevents excessive pressure; B, cushion-like characteristic of resin permits settling of denture without impingement upon raphe.

Fig. 25—Palatal view of denture in which resilient resin was used in palatal relief area, posterior postdam area, and buccal peripheral seal areas.

the mucosa. It has likewise been observed that an overextended border of a resilient resin denture does not produce the same degree of irritation as does one of hard acrylic.

The problem of maintaining the correct postdam relationship of denture and tissue is simplified because any undue pressure of the denture in this region is relieved automatically by the resilient nature of the soft resin (Figs. 24 and 25).

Inasmuch as the new resilient resins are copolymers of the methacrylate group, they can be used in conjunction with the standard types of methylmethacrylate (acrylic) denture base materials with the knowledge that a perfect union of the types of material is possible and that the physical properties compare favorably with the standard denture base materials.

808 *South Wood Street.*

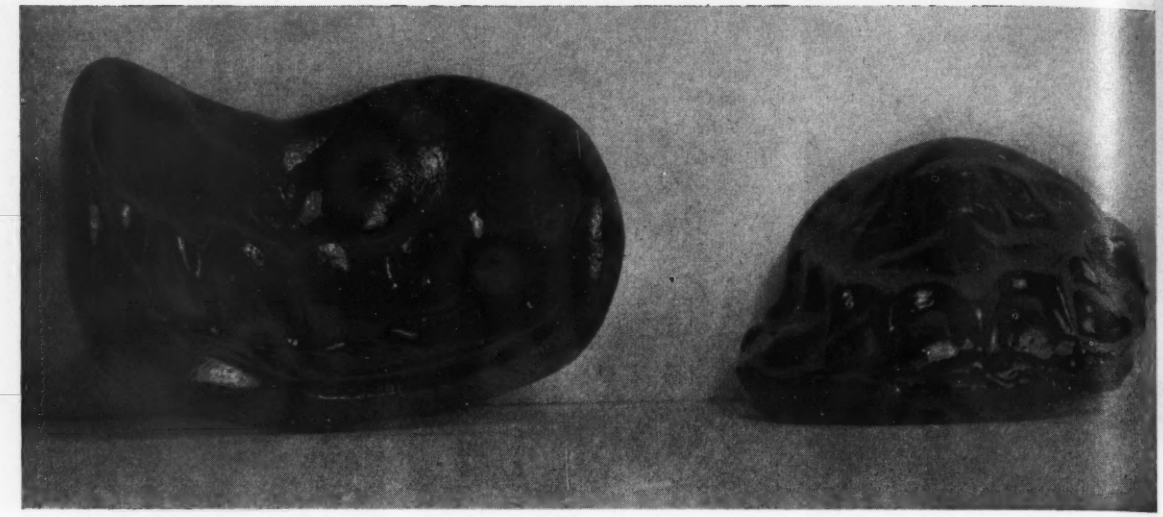


Fig. 1—Split compound impression taken before tooth is prepared.

Technique for Acrylic Crowns and Inlays

A. M. LODMELL, D.D.S., Walla Walla, Washington

DIGEST

A technique is described for preparing an acrylic crown with a translucent incisal tip which is esthetically desirable on the anterior teeth. The casting technique, which I have used for three years, results in a hard, dense crown which shows no sign of wear and no change in color.

OVER A PERIOD of three years I have found acrylic restorations made by the technique described here to be entirely satisfactory esthetically. They have shown no change in color and no signs of wear, and have caused no gingival irritation.

Crown Technique

1. Before applying the rubber dam, take a split compound impression of the tooth to be crowned (Fig. 1).

2. Select the correct shade of acrylic.

3. When the dam is in place, prepare the tooth with a shoulder as for a porcelain crown. Diamond points are excellent for this and are time-saving.

4. After the tooth is prepared, take a compound or wax impression in a copper band, being sure that the copper band is contoured to fit the gingival shoulder exactly.

5. Remove the dam and adapt soft inlay wax to the preparation. Press the lubricated compound impression to place immediately on both the lingual and labial; this produces an anatomic contoured pattern. After the wax has hardened, remove the compound and trim off the excess wax. The result will be an accurate pattern of the crown (Fig. 2).

6. Pour the copper band impression in stone. When this is hard, separate and adapt 0.001 gauge tin foil to the model. Warm the tin-foiled model slightly in a Bunsen flame,

Fig. 2—Accurate impression (pattern) of crown in wax after tooth is prepared.

Fig. 3—Waxed crown sprued from lingual showing stone die.

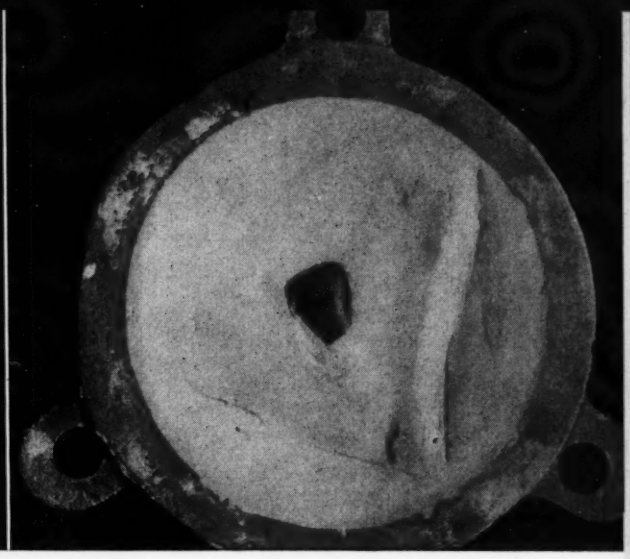


Fig. 4—Armamentarium used in processing: casting machine, split crown and bridge flask, mixing jars for acrylic, inlay rings, Luer syringes for carbon tetrachloride and water glass, sprue formers, copper bands, and screw driver.
Fig. 5—Crown on sprue former poured in stone in wide half of split flask.

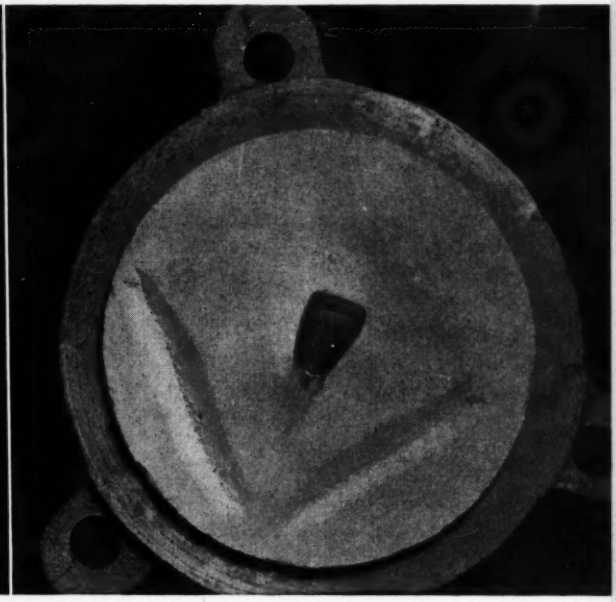
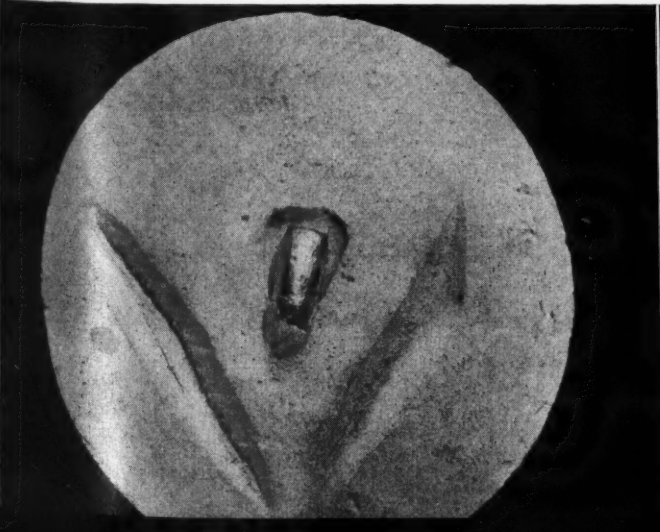


Fig. 6—Stone die of full labial portion of crown poured in narrow half of split flask.
Fig. 7—Wax removed from incisal tip.
Fig. 8—Tin-foiled model after wax has been removed by boiling water.
Fig. 9—Stone die of Fig. 7 poured in stone in narrow half of second split flask.



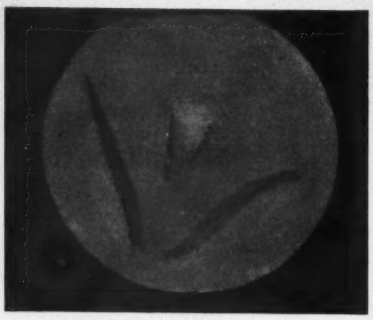


Fig. 10—Crown showing body acrylic without incisal tip.

and push the wax pattern to place on the model. Finish carving on the model, and polish the wax with Anderson Slicketts.

7. Remove the crown from the model (foil will now come off with wax crown). Pour the tin-foiled crown in stone, leaving a slight excess of stone for a handle (Fig. 3).

8. Apply a small button of wax on the cingulum and sprue crown. Place on a sprue former as shown in Fig. 3.

9. Pour the first half (wide half) of the split flask (Fig. 4), and cut two grooves in a V-shape in stone as shown in Fig. 5. Paint the stone with separating medium. I use a separating medium made up of one part water glass to three parts water. Now pour the second half (narrow half) of the split flask (Fig. 6).

10. With a small carver, cut the wax from the incisal third until the tin foil is seen but not entirely exposed (Fig. 7). Now use the narrow half of another split flask, and place it on the flask with the wax pattern (Fig. 7), and pour in stone. This provides a stone die to use for the incisal tip (Fig. 8).

11. Separate without heating, and remove the wax with boiling water. Insert a match plug in the sprue hole. Clean the model thoroughly with carbon tetrachloride, using a Luer syringe to force the carbon tetrachloride all around the model. Paint the model with water glass; allow this to stand for a few minutes, then blow off the excess with air from the unit. Fig. 8 shows the case ready for packing.

12. Mix the body polymer and monomer in one jar (Fig. 4), and

Fig. 11 (top)—Crown showing full labial surface with body and incisal colors.
Fig. 12 (bottom)—Casting machine with split flask in place ready for curing.

Fig. 13—Finished acrylic crown.

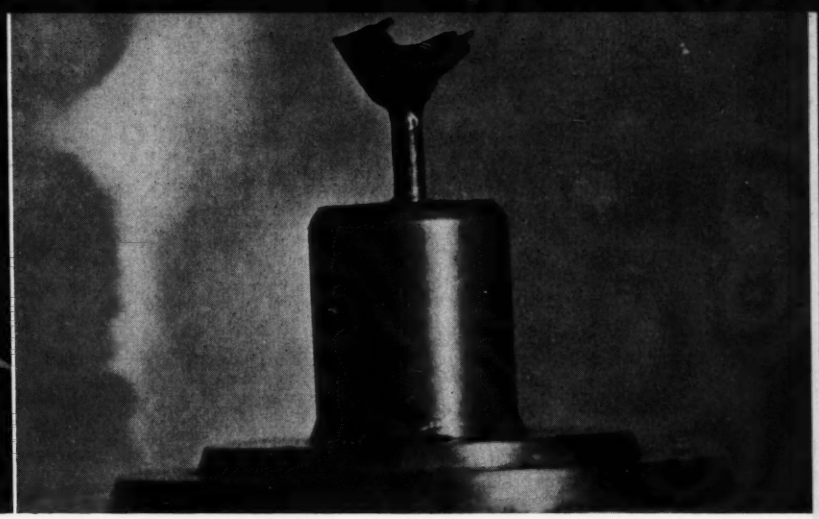


Fig. 14—Class 4 incisal step wax pattern.

the incisal polymer and monomer in another jar.

13. Place the body acrylic over the tin-foiled model and cover with wet cellophane. Place the narrow half of the second flask (Fig. 9) on the model and press together with hand pressure. Open the flask and remove the excess acrylic (Fig. 10).

14. Place the second (incisal) mix of acrylic on the incisal third and cover with wet cellophane. Place the narrow half of the first flask (full crown die) (Fig. 6), and press down as before.

15. Open the flask and remove the excess acrylic. Cover with wet cellophane, and bolt the flasks together. So far we have paid no attention to the casting of the lingual portion of the crown. The match stick plug is removed from the sprue former hole, and the remainder of the body acrylic is placed in the sprue former hole and is set in the casting machine (Fig. 12) and forced in the sprue hole. The last operation completes the casting by forcing the acrylic on the lingual half of the crown to meet the labial half which was done in the two previous steps. Do not force the acrylic into the hole rapidly but screw the casting machine down gradually.

16. After the casting is completed it must be cured. Place the casting machine in a pan of cold water. Slowly raise the temperature of the water to the boiling point and allow to boil for 90 minutes. After the curing is completed, let the case cool gradually.

17. Remove the crown, and clean the plaster and the tin foil from the crown with burs. The tapering flask simplifies removal of the stone. Place the crown on the original stone model, and polish with cuttle-fish discs, pumice, and white rouge.

18. Set the crown with Kryptex. The finished crown is shown in Fig. 13.

Inlay Technique

Inlays are cast in single rings as shown in Fig. 4. Lingual dovetails in class 4 cavities do not have strength on the incisal edge, so in all my class 4 preparations I use the incisal step. The cavity should be prepared in box-like form for sufficient bulk. Small holes are drilled in the incisal and gingival margins with number 557 cross-cut fissure burs to lock the inlay in place (Fig. 14).

Comments

An acrylic crown with a translucent incisal tip is indicated in any of the anterior teeth. The casting technique described here results in a hard, dense crown. A pressure of 2000 pounds is applied directly on the acrylic and is held there throughout the curing. During my three years of making crowns, I have not seen one of them change color. Another important feature of the acrylic crown is that when it is being fitted into place, if it must be trimmed for contact or bite, it can be polished immediately, whereas porcelain must be reglazed. Up to the present time the cementing of acrylic inlays has not been entirely satisfactory. I am hopeful that soon we will have an acrylic cement that will give better results.

317 *Baker Building.*

Unsolicited Manuscripts Are Welcome

"When you have made an observation of value or reached a conclusion concerning the unusual, publish it. Avoid carrying unpublished knowledge to the grave!"—Sir William Osler.

Temporomandibular Malarticulation

MARVIN M. SUGARMAN, D.D.S., Atlanta, Georgia

DIGEST

A case is reported in which tubal catarrhal deafness was improved by restoring the normal anatomical relationship of the temporomandibular joints by means of dental appliances.

The initial dental appliance was a transitory acrylic splint which placed the jaws in a normal vertical dimension. Final treatment, which restored normal occlusion permanently, consisted of the application of gold onlays to the posterior teeth.

History of Case

The patient, a white woman aged 30, began to notice a "popping" in the ears in August 1940. At that time there was no deafness. The patient reported that she had noticed a "clicking of the jaws" since childhood. She underwent tonsillectomy and occasional insufflation of both eustachian tubes, but the symptoms persisted.

One year later she noticed that she was having difficulty in hearing; this gradually increased in severity. She also noticed that whenever she had a cold there was complete occlusion of the eustachian tubes as well as of the nasal passages. Treatment consisted of nasal sprays three times a day, but the condition became increasingly worse. A submucous resection of the nasal septum was done. This gave her relief for three months, but soon the condition became more severe. The patient suffered from a "continual feeling of tightness in the face and head." The eustachian tubes remained slightly open for only two or three days at a time; there was difficulty in breathing; and a severe attack of dizziness ensued which lasted for six weeks.

Examination of the ears revealed the right drum to be retracted; the cone of light was diffused. The left drum was thickened and retracted; there was no cone of light on the

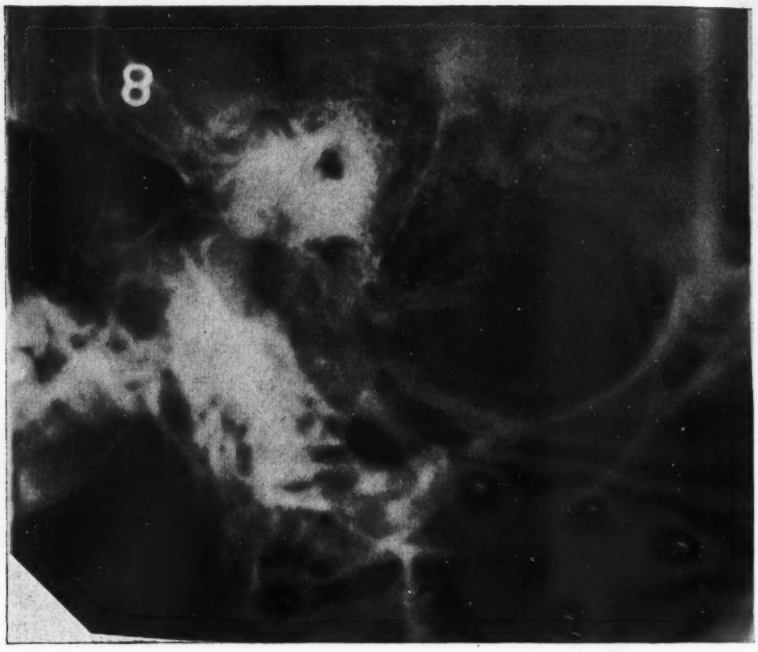


Fig. 1—Before treatment: right temporomandibular joint normal; auditory meatus clear.

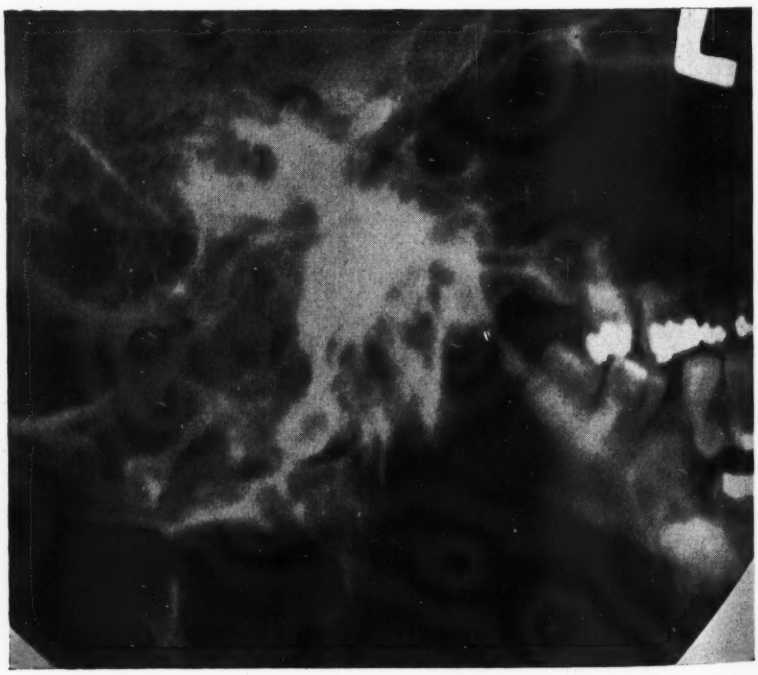


Fig. 2—Before treatment: left side; condyle in posterior portion of temporomandibular socket; auditory meatus cloudy.

Fig. 3—Side view before treatment.

drum. A hearing test revealed hearing in the right ear to be 30/24; hearing on the left was 10/24. At this time there was occasional improvement, but this could not be maintained. A diagnosis of tubal catarrhal deafness was made.

Dental Examination

On June 7, 1943, the patient was first seen on dental consultation. Examination revealed the following:

1. The vertical relationship between the maxilla and the mandible was diminished.

Fig. 4—Front view before treatment.

Fig. 5—Transitory acrylic treatment splint in position.

Fig. 6—Bite closed with splint in position.

Fig. 7—Lower teeth built up with gold onlays.

2. There was an overclosure of the bite, and a slight drift of the mandible laterally to the left side.

3. The tissue tone, teeth, and general mouth hygiene were good.

4. The dental roentgenogram showed a loss of the lower left first molar, and unerupted upper and lower third molars on the right. The lower left second molar had drifted mesially, causing a periodontal pocket. The roentgenographic report of the temporomandibular area on April 8, 1943 (Figs. 1 and 2) stated: "The right joint appears normal. The auditory meatus is clear. The head of the condyle on the left is in the posterior portion of the temporomandibular socket, apparently causing pressure and erosion. The auditory meatus is cloudy, indicating edema."

The facial contour at that time showed fullness of the lips and a line between the lower lip and the chin (Fig. 3). The incisors presented an overbite so great that the lower teeth could not be seen (Fig. 4).

Initial Treatment

On June 9, 1943, an acrylic splint was made to raise the bite. Figs. 5 and 6 show the splint in position with the mouth both open and closed. The patient was instructed to wear the splint at all times except when eating. The purpose of the temporary treatment was to eliminate any hasty cor-

Fig. 8—Gold onlays on upper teeth.

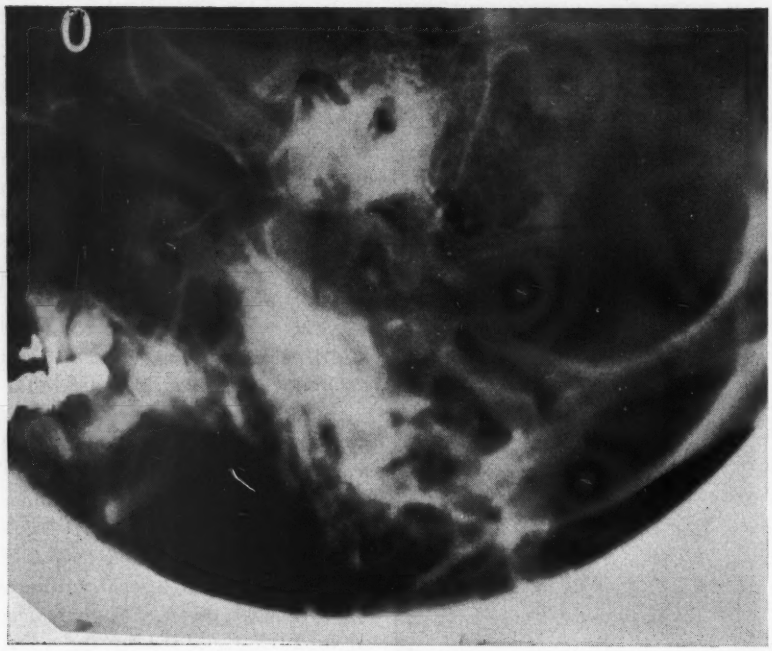


Fig. 9—After treatment: right temporomandibular joint normal; condyle in anterior portion of socket; auditory canal clear.

Fig. 11—Closed bite relationship two months after restoration with onlays.

Fig. 12—Side view after treatment.

rection which might be detrimental, and to evaluate the efficacy of the splint. Three days later the patient reported improvement of her symptoms.

On August 24, 1943, the patient was entirely relieved of the "tight feeling" in the face and head, and the ears no longer "popped." No recurrence of the dizzy spells had taken place; the eustachian tubes had remained open since the application of the splint; and the hearing had improved.

Final Treatment

It was thought the proper time to proceed with a permanent restoration of normal occlusion. This was accomplished by cutting the acrylic splint in half, keeping one half in place while checking the occlusal relationship of the teeth. The teeth were prepared for onlays by using a slice preparation on the mesial and distal surfaces with a buccal and lingual lock. The onlays were then completed and cemented. The teeth on the other side were treated in the same manner (Figs. 7 and 8).

The roentgenographic report of August 27, 1943 (Figs. 9 and 10) stated: "The temporomandibular joints are normal. The condyles are

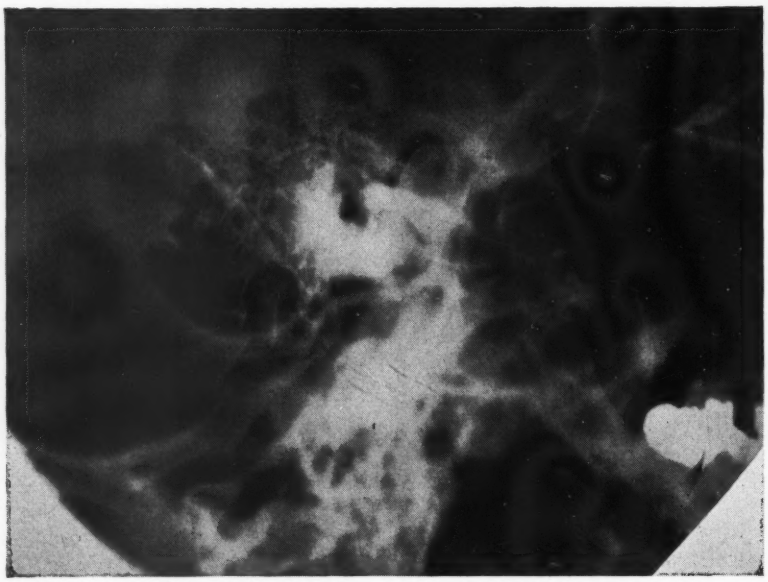


Fig. 10—After treatment: left temporomandibular joint normal; condyle in anterior portion of socket; auditory canal clear.

in the anterior portions of the temporomandibular sockets. The auditory canals are clear."

The patient was seen again on October 13, 1943. She was free of symptoms and her hearing was improved. Figs. 11 and 12, which were taken at that time, two months after application of the onlays, show the improved occlusion and profile.

On November 13, 1943, tests showed hearing of 24/24 in the right ear, and hearing of 16/24 in the left ear. The patient had no complaints and received her medical discharge.

She was seen last on January 11, 1944. She had none of the pretreatment symptoms, and her hearing had improved. The patient has received no medical treatment since October 1943, and has experienced no return of the symptoms although she has had an occasional cold.

Comments

Catarrhal closure of the eustachian tubes resulting in impairment or loss of hearing may sometimes be due to faulty articulation of the temporomandibular joints. Correction of this malarticulation by dental appliances may alleviate the symptoms.

602 *Medical Arts Building.*

Arteriovenous Aneurysm Resulting from Application of Roger Anderson Splint

LIEUTENANT COMMANDER PAUL W. GREELEY (MC) AND LIEUTENANT ALBERT H. THRONDSON (DC), U.S.N.R.

ALTHOUGH IT is admitted readily that the use of external pin fixation has a definite place in the management of fractures of the mandible, certain potential complications in its technical application may be overlooked. A patient recently under our care developed a complication that we feel should be recorded.

A man suffered an oblique fracture through the right angle of the mandible. An early reduction was performed and the teeth were wired in occlusion. Because the mandible was edentulous posteriorly, a Roger Anderson external pin fixation splint was substituted to stabilize the posterior fragment in the reduced position. The wires were removed after partial union to permit early motion and use.

At the time of application of the splint, one of the pins accidentally injured the underlying facial artery and vein. A pulsating swelling developed immediately. The mass grew quickly to the size of a walnut. Pulsation continued for about one month, following which the mass gradually solidified but remained approximately the same size.

The splint was removed six weeks after application with evidence of good union at the fracture site. Three weeks later the tumor was explored. A thrombotic arteriovenous aneurysm was found, and was removed by resection between the ligated proximal and distal ends of the facial artery and vein. An uneventful convalescence followed its removal.

We feel that thoughtful preoperative planning will readily eliminate the likelihood of the future occurrence of this complication in the management of mandibular fractures. It should likewise be pointed out that the same principles should be observed in using external pin fixation apparatus in the treatment of fractures elsewhere in the body.

—From *J.A.M.A.*, 124:1128 (April 15) 1944.

We Can't Pay You, But—

NO DENTAL author can ever be *paid* for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often expends money for drawings, photographs, models, or graphs. We would like to help defray some of these expenses.

Until further notice, THE DENTAL DIGEST *will allow* $25.00 *toward the cost of the illustrations provided by the author of every article accepted.*

About 20,000 of our dental colleagues are in military service. Few of them will have the time, the facilities, or the opportunities to develop new techniques or to write for the dental literature. They will be eager, however, to read of the new developments in dental science and art.

Writing articles for publication in technical journals can be a contribution to the war effort, because that is how to help our dental officers in the Army and Navy keep abreast of technical advancements, and it is one way to improve the skill and services of civilian dentists on the home front.

If you have a constructive idea, an innovation, a new result of tried and proved experiment, put it down in writing, illustrate it, and send the material to: The Editor of THE DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

We hope that you will accept this invitation!

Clinical and Laboratory Suggestions*

CHESTER J. HENSCHEL, D.D.S., New York City

XIV. A Practical Shade Guide for Silicates

It is always best to match colors with the same material as the one intended for use; it is not wise to use a shade guide made of baked porcelain for matching silicate cement colors. There are a number of good brands of silicate cements but some have unsatisfactory color guides; moreover, most operators have favorite cross colors or combinations for which a guide would be desirable.

The bottle and celluloid strips from an old DeTrey's shade guide may be

*These are the fourteenth, fifteenth, sixteenth, and seventeenth of the series of Clinical and Laboratory Suggestions.

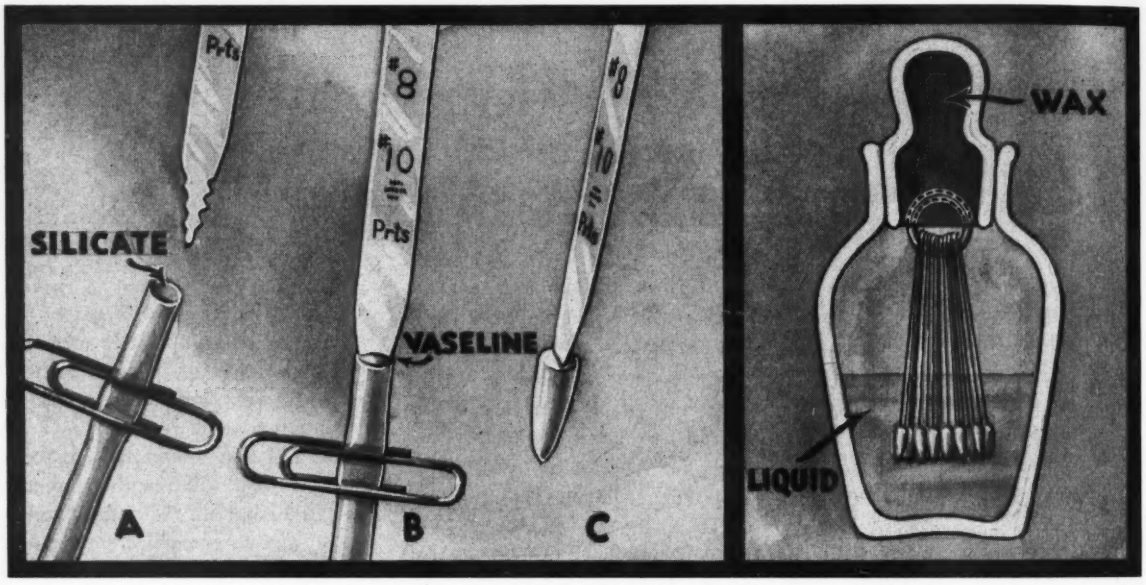


Fig. 14—Left: A, Numbered, serrated celluloid strip ready for insertion in soft silicate; B, celluloid strip inserted in silicate until it is hard; vaseline covers exposed silicate; C, finished shade guide. Right: shade guides strung on ring and suspended in bottle of liquid to keep them moist.

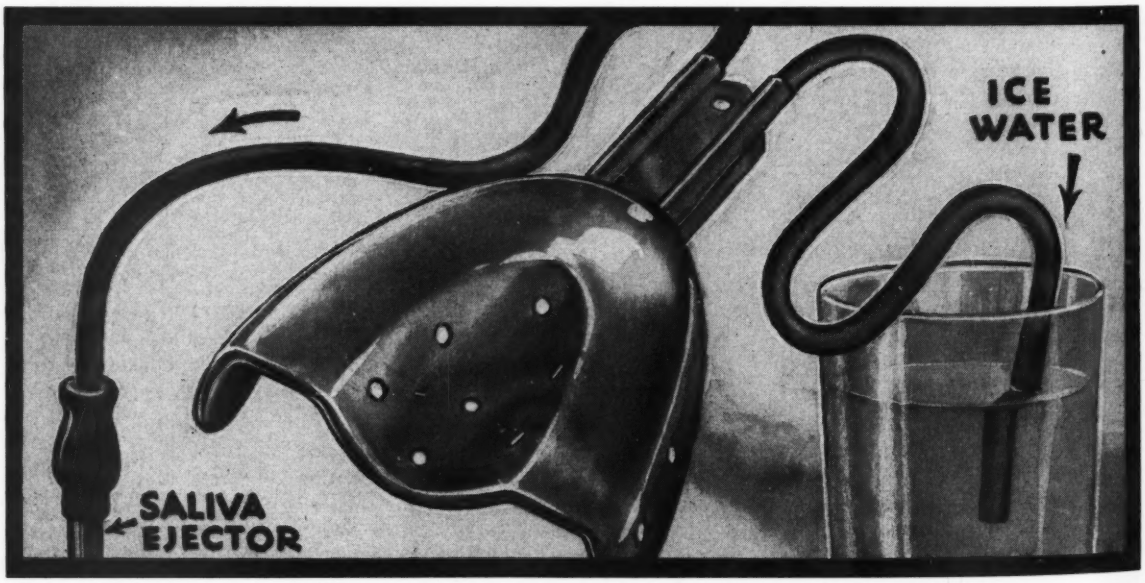


Fig. 15—Positive water pressure which causes leaks from water jacket tray is eliminated by holding inlet tube in ice water and attaching outlet tube to saliva ejector.

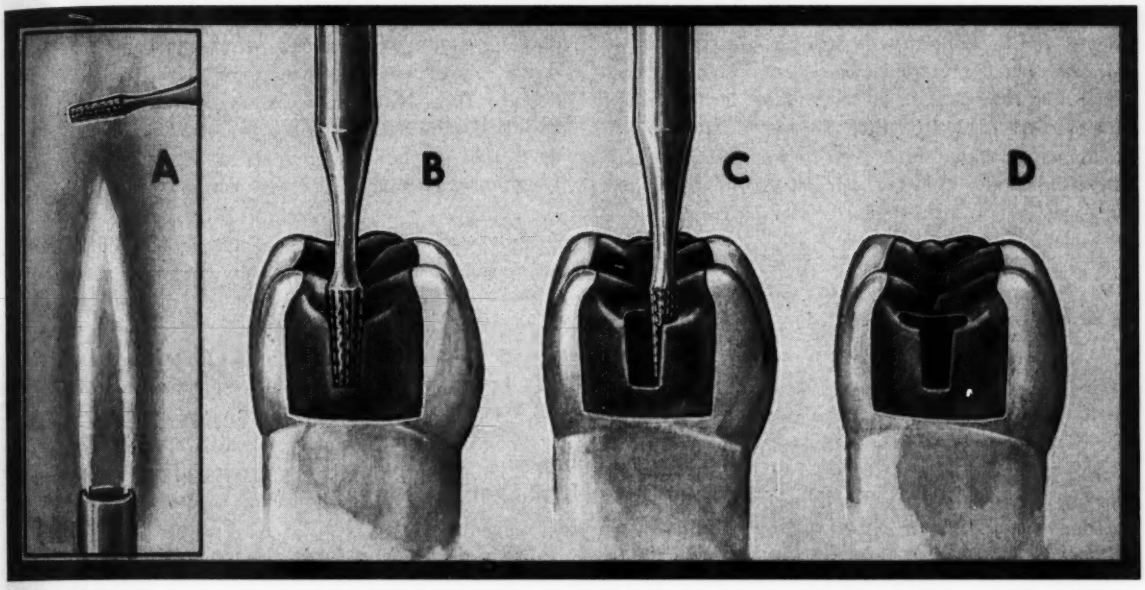


Fig. 16—A, Tapered bur being warmed over flame; B, warm bur being sunk into proximal surface of wax pattern; C, smaller bur being used in same manner to create lock-in type or precision type attachments; D, finished pattern, lug seat prepared.

used if the silicate guide teeth are removed. If a DeTrey's shade guide is not available, a good substitute is a horseradish bottle with the hollow glass stopper filled with wax to hold a metal ring in which are strung strips of celluloid (Fig. 14).

1. Prepare the celluloid strips and number them with India ink according to shade.

2. Mix the desired silicate shades, and pack the mix into a cellophane straw which has been occluded with a paper clip one-half inch from the open end.

3. While the silicate is still soft, deeply embed the serrated, pointed end of the celluloid strip.

4. Cover the exposed silicate with vaseline and, after the silicate has hardened, pull it out of the straw. The guide tooth resembles a lower anterior tooth.

5. The guide teeth must be kept moist; therefore, they are hung in a bottle and covered with water containing a few drops of formaldehyde.

XV. A Leaky Water Jacket Tray Put to Use

Occasionally, the water-jacketed impression trays for hydrocolloid materials develop unaccountable leaks, sometimes at an inconvenient moment.

Such a tray may be used success-

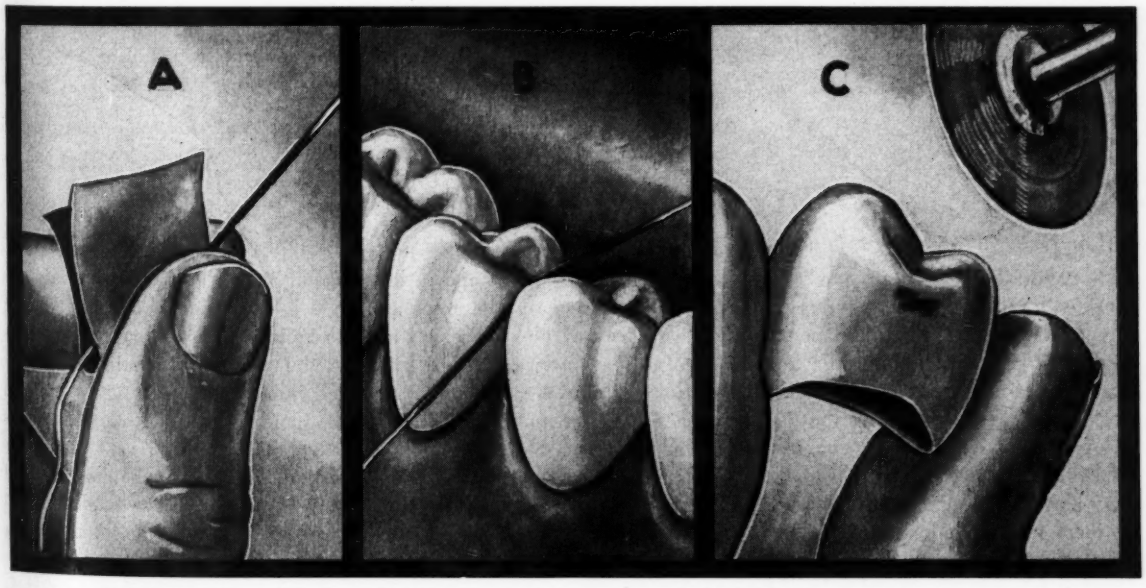


Fig. 17—A, Dental floss being pulled through a fold in articulating paper to color the floss; B, colored floss being snapped between faulty restoration (in place) and adjacent tooth; C, revolving stone about to grind off colored high contact point of jacket.

fully if it is disconnected from the faucet, and the inlet tube is held under cold water, preferably ice water. The outlet tube is attached to the saliva ejector (Fig. 15); thus there is no longer a positive water pressure to cause the tray to leak, but a negative pressure which makes leakage impossible.

XVI. Preparation of Lug Seats in Wax Patterns

If a female box or lug seat is required in an inlay, it is wise to carve it in the wax pattern to avoid the laborious task and waste of drilling it in the cast gold inlay. Cutting and carving instruments are generally unsatisfactory for this purpose.

1. Select a dull, tapered fissure bur of the proper size (number 701), warm it gently by flaming, and allow it to melt its way slowly into the pattern (on the die or tooth) (Fig. 16).

1. Before the bur cools and the wax congeals, a twist or two of the bur in the fingers will cut the wax and free the bur.

3. This procedure may be repeated or exaggerated by using smaller burs (numbers 669 or 700) for lock-in type or precision type preparations.

4. When the receptacle is satisfactory, the pattern may be readapted, removed, sprued, invested, and cast.

XVII. Determining an Interproximal High Spot

It is frequently difficult to determine the exact point of binding, or high spot, on the interproximal surface of an inlay and especially a porcelain or acrylic crown. Gold surfaces may be satin-finished with a rubber wheel and then will show such high spots as shiny areas, but tooth color restorations present a greater problem.

Pull a length of dental floss through a folded piece of soft (not waxed) articulating paper, thus coloring the central portion of the silk. When this has snapped interproximally, with the faulty restoration approximally in place, the blue color will be transferred to the high spot which now appears colored and may be accurately ground and adjusted (Fig. 17).

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You do not have to write an article. The fewer words the better. If you can furnish rough drawings or sketches, we will make suitable finished illustrations. This shouldn't take 10 minutes of your time.

Send your ideas to: Clinical and Laboratory Suggestions Editor, THE DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

Leukemia in Physicians

LEUKEMIA MAY occur in persons who work with radiation under conditions similar to those in which carcinoma of the skin due to radiation can arise. Exposure to roentgen rays under experimental conditions favors the development of leukemia in animals. Inasmuch as high energy radiations may play a part in human leukemia, workers in the National Cancer Institute[1] have compared the incidence of leukemia in physicians and in the general population on the basis of the death lists of physicians in the *Journal of the American Medical Association*, the mortality reports of the United States Bureau of the Census, and an unpublished compilation of the United States Public Health Service. The ratio of deaths from leukemia to deaths from cancer, the ratio of deaths from leukemia to total death rates, and death rates from leukemia were studied with the result that leukemia "was recognized approximately 1.7 times more frequently among physicians than among white males in the general population." The result is in accord with the increase in the incidence of leukemia in animals exposed to roentgen rays. Whatever the full meaning of the data at hand may be, the hazards of radiation require the strict maintenance of complete protection at all times.

—From Current Comment, *J.A.M.A.* 124:1136 (April 15) 1944.

[1]Henshaw, P. S., and Hawkins, J. W.: Incidence of Leukemia in Physicians, J. National Cancer Institute, 4:339 (February) 1944.

The Editor's Page

AN EMERGENCY that may require the dentist to apply artificial respiration develops occasionally in the dental office. On other occasions outside the dental office the dentist may be the only person available who has enough knowledge of first-aid methods to institute artificial respiration for the victims of carbon monoxide poisoning, electric shock, or drowning.

Dentists and physicians have been trained in their courses in physiology to use the Schaefer, or the prone, method of artificial respiration.[1] This "consists in laying the subject in the prone position, preferably on the ground, with a thick folded garment underneath the chest and epigastrium; extend the arms forward. The operator puts himself athwart or at the side of the subject facing his head, and places his hands on each side over the lower part of the back (lowest rib). He then slowly throws the weight of his body forward, to bear upon his own arms, and thus presses upon the thorax of the subject and forces air out of the lungs. This being effected, he relaxes the pressure by bringing his own body up again to a more erect position, but without moving his hands." This method is the same that is usually given in Red Cross first-aid courses.

A surgeon in the British Royal Navy has recently described an entirely different procedure in artificial respiration. His method is based on the principle of "rocking" the subject up and down while strapped face downward to a rigid object. The idea is that the weight of the abdominal contents will push and pull against the diaphragm and thus stimulate this muscular tissue into activity. The physiologic theory is described as follows:[2] "The main respirating agent is a thin sheet of muscle (the diaphragm) at the base of the lungs. In health this is pulled up into a dome by the elastic contraction of the lungs. When the diaphragm contracts, its dome is lowered and air is pulled into the chest. But when the diaphragm loses its tone progressively, as in drowning, it is pulled up by the elastic lungs into a position of extreme expiration. Schaefer's method would then be useless, especially as it depends entirely on the elastic tone of muscles (no longer present) for inspiration when the pressure of the hands is taken off the patient's back."

In the "rocking" method, the patient is alternately tilted from a head-down position of 45° to a head-up position of 45°. The tilting is done ten times a minute. In the British Navy the patient is laid face downward and is lashed to a stretcher that is supported either on a trestle or on a loop of rope. In the case of drowning, the first head-down tilt of 45° is maintained until no more water drains from the stomach or the lungs.

The originator of this "seesaw" method emphasizes that artificial respiration includes two other factors besides ventilating the lungs:[2] "I submit that resuscitation is actually a trinity of ventilation, circulation, and warmth directed to supplying warm blood, oxygenated by moving lungs, to the microscopic nerve cells which maintain respiration and tone. . . . Probably in the future the merits of rival methods of resuscitation will be judged more by their effects on the circulation than on ventilation, which is so much easier to produce and to measure."

The "rocking" method is most effective when the patient is placed on a rigid object such as a plank, a door, or a stretcher. It is possible, however, that two or three persons might hold the victim in their arms and alternate the head-up and head-down positions.

Dentists in both military and civilian life never know when they may be called upon to act in an emergency outside the strict confines of a dental practice. We should always be prepared for such contingencies.

[1] Zoethout, W. D., and Tuttle, W. W.: A Textbook of Physiology, ed. 7, St. Louis, C. V. Mosby Company, 1940, page 325.
[2] Eve, F. C.: Resuscitation of the Drowned Today, J.A.M.A., 12:964 (April 1) 1944.

Learn something about your War Bonds from this fellow!

THE BEST THING a bulldog does is HANG ON! Once he gets hold of something, it's mighty hard to make him let go!

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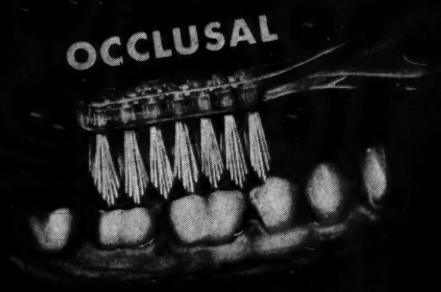

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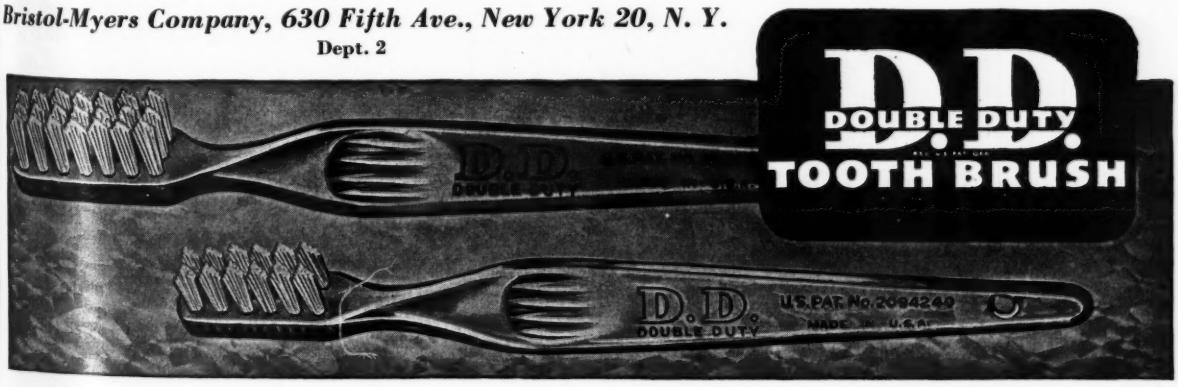

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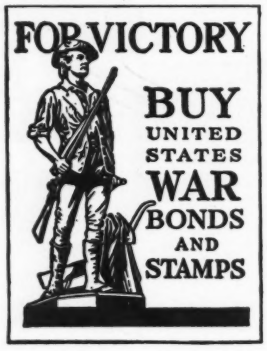

Contra-Angles

Technique for Attending a Dental Meeting . . .

After the laborious attending of dental meetings and conventions, I have developed a technique for endurance which works reasonably well and which I should like to report. If the speaker is a fellow who gets down to his business promptly and presents his material in an orderly fashion, I am inclined to pay close attention and to take generous notes. On the other hand, if the speaker believes he must use the methods of a master of ceremonies, that he must start with jokes, "corny" or otherwise, and if he is intrigued with his own voice rather than with the subject that he is introducing, he presents a distinct threat to the audience. Then, too, a late start of the session, a meeting room heavy with smoke, and seats that are too straight and hard, are additional hazards to careful attention.

In other cases the essayist cannot read his paper; he stumbles over it as if he were looking at it for the first time. If he is a free-hand style expositor, he sometimes fails to remember what subject he was to present. He talks for an hour or so and what he says does not make much sense. He has submerged his gems of wisdom in a surplusage of words. Digging out the pay dirt is too hard a job, so I fall asleep if the pictures are on and the lights are out.

In those cases in which the speaker is of the vigorous, loud shouting, evangelical sort, I have developed the skill of going into a trance while looking the speaker in the eye seemingly attentively. I am sure that this is some kind of psychosis, but I am

(*Continued on page* 226)

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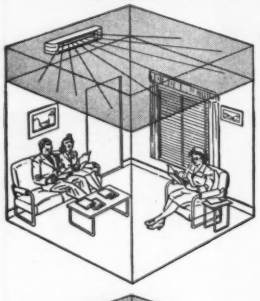

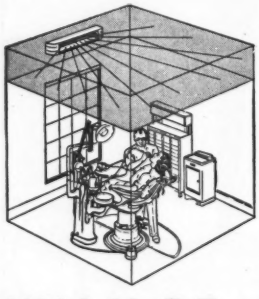

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Don't repeat even *little* things about our war program unless they've been published or broadcast. Think *before* you talk!

not going to do anything about it. Although present in the flesh, in the thick air of a dental meeting I can think of faraway things—the purple haze over the hills, snow on the evergreen trees, a fish breaking water, the black smell of the garden earth. When the applause comes at the end of the speech, I break the spell and clap my hands with everybody else. If my neighbors express the opinion that it was a good speech, I am willing to agree.

Try this technique the next time you are bored with a dental speaker.

Test Yourself . . .

The popularity of self-quizzes, testing yourself for odd bits of information, has increased in the last few years. A serious and scholarly writer has recently suggested some tests that a college graduate should apply to himself.[1] It might be well if we all applied these seven tests to ourselves to see if we are really living up to our responsibilities as college graduates:

"1. *Intellectual curiosity*, the thirst for knowledge. Do not take the world for granted but try to find out about it.

"2. *Critical judgment*. Do not accept your teachers' words or the textbooks as authorities. Remember that they merely represent individual views. Do not be afraid of contradicting 'authorities' if you think you have valid arguments. You must find the truth for yourself, and remember that this is a lifelong job.

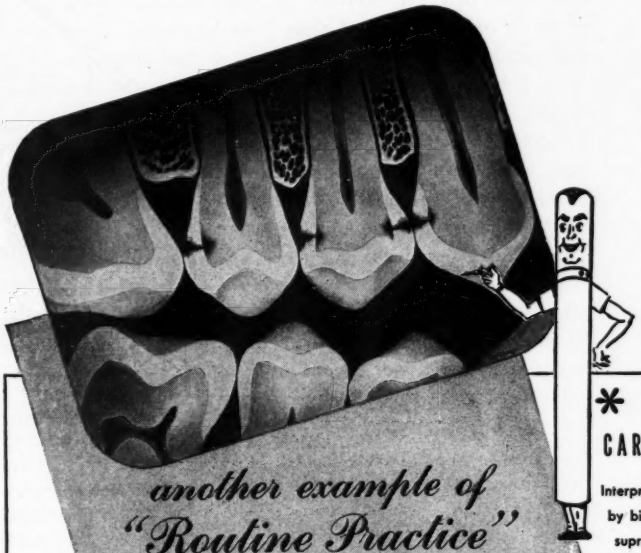
"3. *Imagination*. Experts will tell you what cannot be done. They may be right, but do not believe them. If you have ideas, stick to them. Progress begins with dreams and is achieved when they become reality. It is difficult to develop imagination in students but very easy to kill it.

"4. *A correct sense of values*. Try to find out what is really important in life and what is not. And develop a positive attitude toward mental and physical health.

"5. *Social consciousness*. Keep always in mind that you are a member

[1]Sigerist, H. E.: Editorial, Bull. Hist. Med., 15:4 (January) 1944.

(*Continued on page* 228)



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of a society that grants you great privileges but toward which you have just as great obligations. Be ready to serve your fellowmen at any time with all your faculties, and remember that the welfare of the group is more important than your individual welfare.

"6. *Correct use of the mother tongue.* Think clearly so that you may express yourself clearly. Enrich your vocabulary and your practical knowledge of grammar daily by reading the great past and contemporary writers critically.

"7. *Knowledge of working methods.* Learn to attain knowledge through observation, experiments, correct reasoning, the use of books and other tools. Do not work haphazardly but planfully. Set yourself a definite goal periodically and work toward that goal systematically."

The Hush-Hush Parade . . .

Military secrets must be safeguarded. People should not be going around blabbing off their mouths about subjects that would give aid and comfort to the enemy. But there are a lot of people now engaged in nonwar activities who like to surround their tedious jobs with an aura of mystery. Women seem to be worse offenders than men; they like to imply that their menfolk are engaged in vital work fundamentally important to the war activity.

The "Hush-Hush Parade," a super-secret cult, is something with which every dentist has had some experience. He deals with people who hand out all sorts of information—pipe dreams and the products of nightmares. The dentist listening all day to these stray bits of information may be inclined to take them too seriously. It is just as well that most of the things that are heard over the dental chair are forgotten. It is dangerous to form plans for military strategy on such flimsy information.

The Best Often Loses . . .

A good friend of many years' standing called to chastise me for

(*Continued on page* 231)

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publicly endorsing a candidate who was "bound to lose" in the election for a public office. He told me, and the election results proved his prediction, that the opponent would win the election. My friend advised me that the dentists who endorsed the loser might suffer some reprisals. I agreed that my man probably would lose, and he did.

Democracy requires losers, and likewise requires minorities who are perfectly willing to stand with the losers. There is no disgrace in being the losing candidate nor in being on the losing side. There is a danger to our institutions if there is only one political party or only one faction within a party. A New Deal alone is bad enough, but a Republican Party without factions within it is just as bad.

Lord Bryce pointed out that checks and balances were necessary in a democracy. A Reichstag made up solidly of Nazis is not much different from a Congress made up of one political party. Checks and balances come with opposition; opposition creates discussion; discussion springs from serious thinking; serious thinking inspires social reform. Smugness and self-satisfaction come when there is no opposition. Competition is the soul of business, the heart of the democratic process, and should be preserved.

Sordid political activities within dental organizations are distasteful, undignified, and unproductive, but minorities and majorities with opposing points of view are fundamentally necessary for progress. The American Dental Association is always best served, as is any other organization, when it represents the thinking of people who hold divergent philosophies. Opposition and criticism are not sentiments of disloyalty. It is hard for some people to remember that one can oppose and criticize them but love them just the same. It is hard to convince some people that one can be a loyal part of an organization such as the American Dental Association and still be critical of some of its activities or inactivities.—E. J. R.

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In your ORAL HYGIENE this month

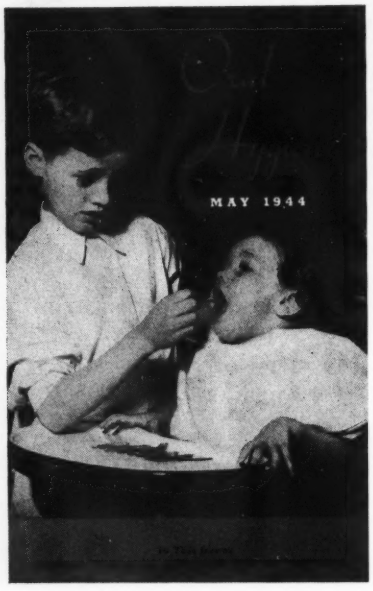
3,357 Readers Vote on Hygienists

Dental hygienists were the topic of ORAL HYGIENE's second Dental Opinion Poll, the results of which are disclosed in the May issue. Rosa Huger, of Northwestern University which sponsors the ORAL HYGIENE Polls under a fellowship provided by the magazine, tells why "The Hygienist Has a Place in Dental Practice," according to the majority opinion of the 3,357 participating dentists. Be sure to vote in *this* month's poll, the topic of which is old-age security for dentists.

"Combat Dentist in Africa" is a thrilling story by Captain Harry N. Cantor (DC). He was in the thick of things.

"Dental Fears of Children Can be Overcome," according to La-Veta Lehn, who deals with methods for correcting the attitude of children toward the dental experience.

"Dentistry in the German Army" reveals some interesting facts about the enemy's military dental service.



"How to Kill a Dental Practice," appears again this month. Enlargements of the photographs in this pictorial series on practice-management are being used at dental society meetings. At the recent Minnesota State meeting, this ORAL HYGIENE feature came to life when the society built a special exhibit based upon it, a dental office showing some of the faults highlighted by the series. Enlargements of the ORAL HYGIENE photos were shown too.

This month's seven departments include Picture of the Month, Dentists in the News, Editorial Comment, Military News, Ask ORAL HYGIENE, Technique of the Month, Laffodontia, and The Publisher's Corner.

In your May

Oral Hygiene

DENTAL MEETING *Dates*

District of Columbia Dental Society, second Tuesday in each month, Medical Society Auditorium, Washington.

•

Tennessee State Dental Association seventy-sixth annual meeting, Hotel Peabody, Memphis, May 22-25.

•

Ontario Dental Association, seventy-seventh annual meeting, Royal York Hotel, Toronto, May 29-31.

•

New Mexico State Dental Association, annual meeting, Albuquerque, June 4-6.

•

The Northeastern Dental Society Swampscott Convention, New Ocean House, Swampscott, Massachusetts, June 11-14.

•

New Jersey State Board of Dental Examiners, regular meeting, Trenton, June 28-July 2. For information write to Doctor J. Frank Burke, 150 East State Street, Trenton.

•

North Dakota State Board of Dental Examiners, regular meeting, Gard-

(*Continued on page* 237)

(*Continued from page* 232)

ner Hotel, Fargo, July 10-13. For information write to Doctor R. A. Andrews, Secretary, Carrington, North Dakota.

•

Massachusetts Alpha Omegans, in service in this country or overseas, please communicate with Doctor Abraham Gurvitz, War Service Committee, Alpha Omega Fraternity, 371 Commonwealth Avenue, Boston.

•

National Dental Association, thirtieth annual meeting, New Central High School, Cleveland, August 14-18.

•

Connecticut Dental Commission, regular meeting, Hartford, June 20-24. For information write to Doctor C. G. Brooks, 302 State Street, New London.

•

Ohio State Dental Board of Examiners, regular meeting, Western Reserve University, Cleveland, September 11-13; and at the Ohio State University College of Dentistry, Columbus, September 25-27. The practical examination for Dental Hygienists will be held at Ohio State University, September 26. The theory examination for both dentists and dental hygienists will be held in Columbus, September 28-30. For information write to Doctor Earl D. Lowry, 79 East State Street, Columbus.

•

The Women's Dental Society of New York City, regular meetings held September 20, and November 15, Hotel Pennsylvania, New York City.

•

Odontological Society of Western Pennsylvania, annual meeting, William Penn Hotel, Pittsburgh, October 17-19.

•

Montreal Dental Club, annual Fall Clinic, Mount Royal Hotel, Montreal, Canada, October 25-27.

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Penicillin in the Treatment of Cellulitis of the Mouth

WALLACE E. HERRELL, M.D., and DONALD R. NICHOLS, M.D., Rochester, Minnesota

Causes of Cellulitis of Floor of Mouth

1. An incidence of dental sepsis as high as 90 per cent has been reported as the initial lesion preceding the development of the cellulitis.

2. Extensive cellulitis may follow abrasions of the cheek or mouth.

3. Other conditions which may be the origin of the infection include peritonsillitis, otitis, and ulcers of the lip.

4. The cellulitis may develop secondary to the extraction of septic teeth although the infection may follow dental sepsis in which extraction has not been performed.

5. The organisms isolated include streptococci, which may be associated with staphylococci, Vincent's spirillum, micro-aerophilic streptococci, and gas-producing organisms.

Symptoms

1. The inflammation may invade the surrounding tissues rapidly and involve the submaxillary space and the tissues of the neck. The infection may progress slowly, however, and eventually form an abscess.

2. Firm induration of the submaxillary and submental regions is characteristic.

3. Extensive swelling and induration of the floor of the mouth, the gums, and the tongue is evident.

4. The tongue is pushed upward and backward; it is often described as being "frozen" to the roof of the mouth.

5. In most instances, an abscess occurs.

6. The edema of the tongue and throat may interfere with breathing and, in late stages of the infection, may produce asphyxia.

7. The patients become acutely ill. In some instances pathogenic organisms invade the blood stream.

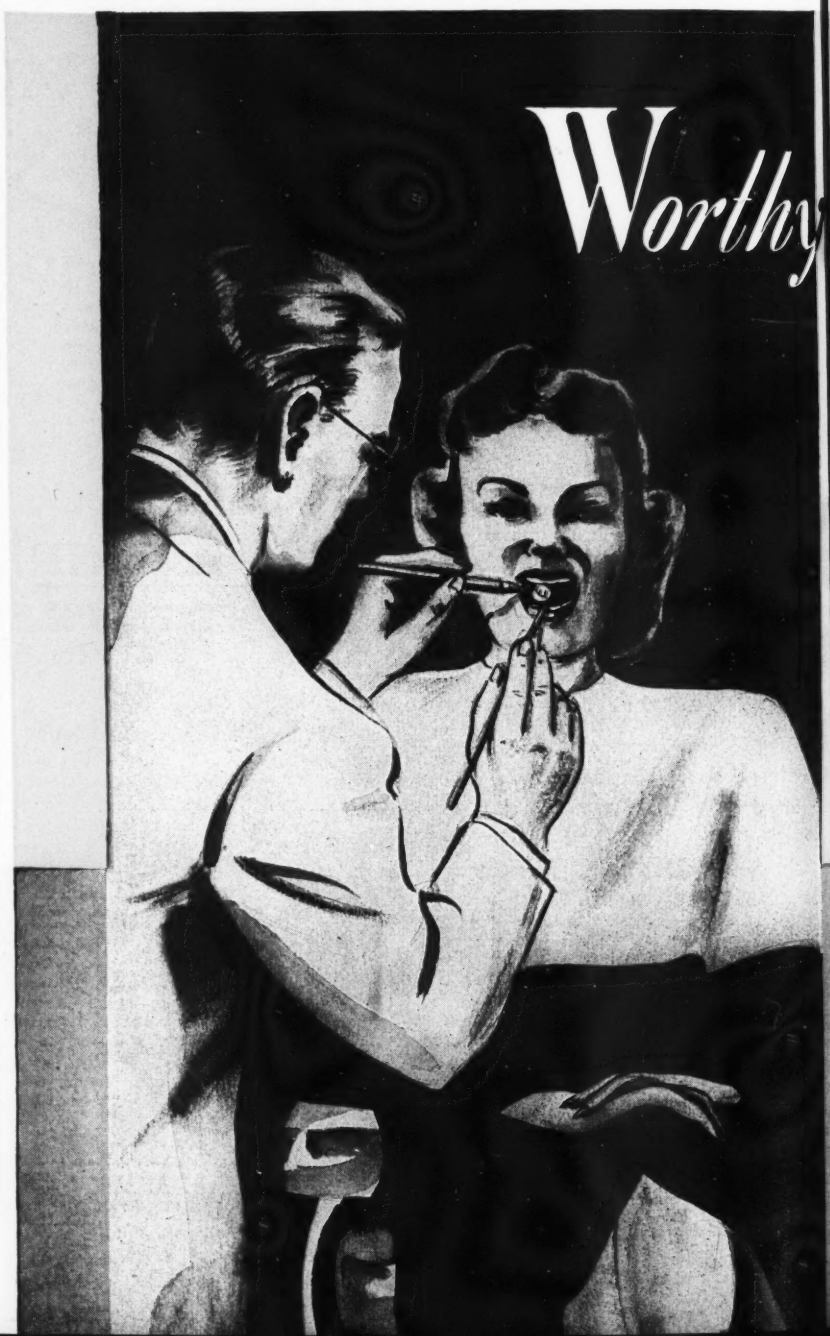
8. There is often a chill, and fever is present in almost all cases.

9. The clinical picture is usually that of marked toxemia.

10. If the inflammation is extensive, mediastinitis or thrombosis of the jugular vein may develop.

Treatment

The local use of heat, roentgen therapy, and sulfonamide therapy, together with either minimal or ra-



dical surgical treatment, have been employed. Penicillin has been used in a small group of cases.

Penicillin—1. It has a highly effective antibacterial action against the majority of the organisms isolated in these cases.

2. It was used only in cases in which the patients were desperately ill.

Administration of Penicillin—1. Penicillin can be administered intravenously or intramuscularly, and may be used locally.

2. It cannot be administered by mouth inasmuch as the acid in the gastric contents destroys the potency of penicillin.

3. Two methods of intravenous administration of penicillin are possible:

a) Single injections every two or four hours. Penicillin disappears rapidly from the blood stream; therefore, the administration in this manner is not the most desirable method.

b) Continuous or nearly continuous intravenous drip. We prefer the continuous drip method because it maintains a constant concentration of penicillin in the blood, and is a simple time-saving procedure.

4. For the intravenous administration, penicillin is usually dissolved in physiologic salt solution, but it may be dissolved in a 5 per cent solution of dextrose in distilled water.

5. We have used two preparations of penicillin for clinical purposes: the sodium salt of penicillin, and the calcium salt. Both are effective and neither produces any significant toxic reactions.

Report of Six Cases

Condition of patients—1. In two cases the cellulitis was complicated by the presence of septicemia. In one of these cases, the organism present in the blood was *Staphylococcus aureus*, and in the other it was a hemolytic streptococcus. In the remaining four cases, the blood cultures were negative.

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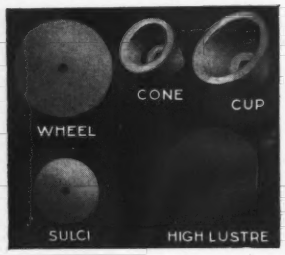

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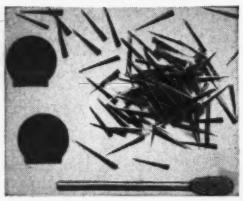

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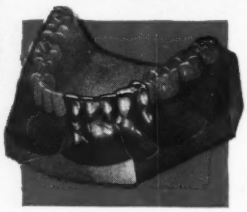

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2. Sulfonamide therapy had been found ineffective in all but one case.

3. All the patients had marked difficulty in swallowing. Several showed induration extending far down into the structures of the neck.

Treatment—The penicillin was administered by the continuous intravenous drip method at the rate of 30 drops to 35 drops per minute. The patients received from 32,000 to 40,000 Oxford units of penicillin in 2 liters of physiologic salt solution daily, half being started in the morning and the other half in the evening.

Results—1. The patients were able to swallow without difficulty within forty-eight to seventy-two hours.

2. The temperature subsided by lysis.

3. The first sign of improvement was a decrease in the toxemia.

4. In the two cases in which the cellulitis was complicated by septicemia, the blood cultures became negative within forty-eight hours.

5. In some instances the edema of the face disappeared rapidly; the induration subsided more slowly.

6. In one case, an abscess formed and ruptured spontaneously through the cheek. Drains were inserted to promote drainage. In no other case was surgical treatment necessary. We believe that surgical drainage is indicated if large abscesses form.

7. The convalescence was usually short and uneventful.

8. The administration of penicillin was continued until it was certain that the inflammation was well controlled. No other treatment other than the local application of heat was used after the administration of penicillin was begun.

Comments

Although the number of patients treated with penicillin for cellulitis of the floor of the mouth is small, it appears that penicillin therapy is an exceedingly effective means of treating this infection. The patients, although seriously ill, responded dramatically to penicillin therapy. There were no deaths. The convalescence was short; in five cases, the longest period of hospitalization was fifteen days. The sixth patient had an extensive infection complicated by septicemia, and had to remain in the hospital for twenty-eight days.

—From Oral Surgery, *Am. J. Orthodont. & Oral Surg.*, 30:1 (January) 1944.

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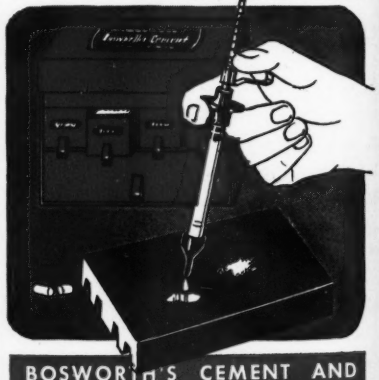

BOSWORTH'S CEMENT AND LIQUID MEASURING DEVICE

Prevent disintegration of the seal between inlay and cavity by having an assured powder-liquid ratio with Bosworth's Cement and Liquid Measuring device. The definite powder-liquid ratio obtained, the cement in measured capsules and liquid in hermetically sealed cartridges, produce dependable, uniform mixes. It takes the guesswork out of cementation.

THE KILE MIXING SLAB

Definite control in mixing cement and silicate is assured with the "air-conditioned" polished black Kile Slab. This automatic self-cooling slab is always below room temperature yet never reaches dew point. Makes mixing accurate, simple, easy.

HARRY J. BOSWORTH COMPANY
1315 S. MICHIGAN AVENUE · CHICAGO